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RESEARCH ARTICLE

Brain Drain: The Determination of Students' Intention to Leave Malaysia

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ABSTRACT

The phenomenon of brain drains, characterized by the migration of highly skilled workers from less developed to developed countries, has become a pressing concern in Malaysia. This study investigates the factors influencing brain drain from the perspective of students in Malaysia. Using a convenience sampling method and Google Forms-based online surveys, data were collected from college and university students across peninsular Malaysia. The sample size of 220 respondents ensured robust analysis. The collected data underwent a rigorous screening process, including normalization tests and PLS structural equation modelling (PLS- SEM), to assess reliability and validity. The findings reveal that salary and compensation, career prospects, family and friends influence and quality of life are significant predictors of brain drain from the students' perspective. However, the working environment did not emerge as a significant contributing factor. The results align with previous studies and fill a gap in research focusing on brain drain factors specifically from the students' viewpoint in Malaysia. The implications of these findings are critical for policymakers and stakeholders seeking to address Malaysia's brain drain conundrum. Understanding the factors driving talent migration is essential for devising effective strategies to retain skilled professionals and mitigate brain drain's adverse effects on economic development. By acknowledging the significance of these factors, policymakers can formulate targeted interventions to promote talent retention and bolster Malaysia's competitive edge in the global marketplace.

1. INTRODUCTION

In the quest for better prospects, skilled individuals often succumb to the allure of distant opportunities, echoing the age-old adage, 'The grass is always greener on the other side.' Yet, in the realm of brain drain, this sentiment takes on profound significance, as it signifies not just individual aspirations but also the systemic loss of talent from home countries. Brain drain, the migration of high-skilled workers from less developed nations to developed ones, has emerged as a pressing concern in contemporary discourse. However, the concept extends beyond mere physical relocation; it encompasses a broader phenomenon wherein individuals, nurtured and educated in their homeland, contribute their expertise to foreign economies as they advance in their careers.

According to Tan (2024), Malaysia is grappling with a significant brain drain crisis exacerbated by less appealing salaries domestically and more enticing opportunities abroad. The Department of Statistics Malaysia (DOSM) underscores this trend, revealing that the allure of sweeter prospects is luring skilled individuals away from their homeland. Furthermore, the devaluation of the Malaysian ringgit against major currencies, notably the US dollar and Singapore dollar, has intensified the brain flight phenomenon. In just a year, the ringgit has depreciated considerably, making overseas opportunities even more financially appealing for Malaysian professionals.

The implications of this brain drain are profound for Malaysia, Southeast Asia's fifth-largest economy, especially as it strives to attract high-value investments and foster economic growth. The impending launch of the Johor Bahru–Singapore Rapid Transit System in 2027 is anticipated to accelerate talent mobility between the two countries, potentially exacerbating Malaysia's talent exodus further. As Malaysia navigates this challenging landscape, understanding the underlying dynamics of brain drain and its impact on the country's economic trajectory becomes imperative. By examining the factors driving talent migration and exploring potential strategies to retain skilled professionals, policymakers and stakeholders can proactively address this pressing issue and safeguard Malaysia's future prosperity. The research objectives of the study are twofold. Firstly, it sets out to examine few factors such as salary and compensation, career prospect, family and friends influence, quality of life and work environment can influence the brain drain in Malaysia: students' perceptions. Secondly, the present study aims to investigate the effect of the few factors on the brain drain in Malaysia; students' perception.

LITERATURE REVIEW

Brain Drain in Malaysia

Malaysia may lose foreign investment and companies if a highly skilled workers shortage continues, as they may relocate their operations to a neighbouring country (Cerna and Czaika, 2021). Low wages and unappealing job nature have caused youth in Malaysia nowadays to migrate in other countries. Therefore, this problem has fulfilled by foreign workers to take the job especially in construction and agriculture sectors. (The Star, October 20, 2022). Due to the significant difference in currency values, professionals have relocated to neighbouring countries such as Singapore. Other factors contributing to Malaysia brain drain include family and friend influence (Kumar, 2021), better quality of life (Ishak and Abdul Aziz, 2014), and a pleasant and secure work environment (Jauhar and Yusof, 2011).

The migration of highly skilled workers to other countries is widely referred to as brain drain. In academic perception, brain drain typically defines as the migration of professional workers with recognition to other countries. This issue has been a major concerned in certain countries because long-term outmigration of educated and skilled workers could have a significant economic impact (Docquier and Rapoport, 2006). Brain drain has been discovered, with many highly skilled workers preferring to work in Organisation Economic Cooperation and Development (OECD) countries. These countries have 38 members and work together to improve their economies. Thus, these OECD countries have enticed people from non-OECD countries to migrate (Kerr, Kerr, Özden, & Parsons, 2016).

The most commonly cited reasons for brain drain rapidity are push and pull factors. 'Push' factors are elements within a country that may encourage its citizens to leave. For example, social injustice, political uncertainty, poor governance, security issues, declining currency value, and other economic concerns. Meanwhile, 'pull' factors refer to elements provided by another country that entice Malaysians to leave. For example, better opportunities in other countries to improve their quality of life (Hussin & Peredaryenko, 2022).

Numerous studies have established the negative effects of brain drain on developing countries. (Noah & Steve, 2012). This phenomenon reduces developing countries' competitiveness by attracting highly-skilled individuals to developed countries (Bashir et al., 2014). Numerous studies explained the factors that influencing brain drain started with an intention based on the theory of reasoned action (TRA) and theory of planned behaviour (TPB) by Ajzen and Fishbein (1969). According to these theories, an individual can have an intention that is intentional and meticulously planned. Evidently, the desire to fulfil out an intention is often driven by the expectation of a positive evaluation outcome from the individual (Ajzen & Fishbein, 1969). There are three factors that may influence the intention such as the person's attitude toward the exercised behaviour, subjective norms and perceived behavioural control (Ajzen, 1985).

Bashir et al. (2014) stated that an individual's decision to migrate or remain in their home country is influenced by their cultural environment, as well as push and pull factors. By applying the Ajzen and

Fishbein model to foreign student decision-making, Baruch emphasises the importance of these factors in influencing migration intentions.

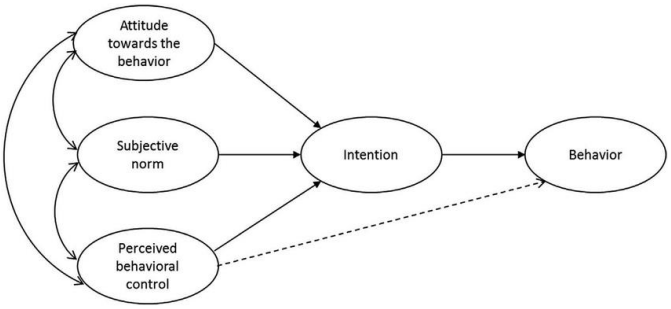

Figure 1: Theory of planned behavior (Ajzen, 1991).

Factors Influencing Brain Drain in Malaysia

Brain drain occur when highly-skilled individuals or professionals determined to move abroad. According to Azadi, Mirramezani and Mesgaran (2020), students play a vital role in determining the future brain drain. Limited job opportunities encourage people to seek work in other countries, prompting researchers to include this factor in their study. Family and friends can also influence people to work abroad, particularly if they have relatives or acquaintances who live abroad and are able to assist them adjust to a new life. Plus, many students from developing countries leave their home countries to improve their family's situation (Krasulja et al., 2016). Individuals are motivated to seek employment in developed countries primarily because of the quality of life there. According to Jauhar and Ghani (2011), attractive factors for professionals include favourable working conditions, legal regulations, higher living standards, peaceful environments, and respect for individual rights. These factors have been included as independent variables in the study. A poor working environment in Malaysia can also lead to brain drain. Individuals who are dissatisfied with their work environment, including issues with compensation, promotion, and other job-related benefits, may seek opportunities abroad (Noah and Steve, 2012).

Salary and Compensation

Jauhar et al. (2015) found that a good salary and compensation have positive relationship on brain drain in Malaysia. This statement was supported by Ghazali et al. (2015), that many highly-skilled worker moved to developed countries such as OECD countries in search of higher compensation. Study from Bashir, Xu, Zaman, and Akhmat (2014) stated that those employees tend to move to the developed countries because of higher expected earnings. Thus, this study proposes that:

H1: There is a relationship between salary and compensation and factors influencing brain drain in Malaysia: students' perception.

Career Prospect

According to Noah and Steve (2012), career prospect is important in influencing brain drain in Malaysia. This is because people tend to emigrate to other countries due to lack of career prospects. This can be supported by Tutik, Takeshi, and Utomo (2014), where these highly-skilled individuals typically seek better environment to improve themselves and help their families. When they are unable to meet their job expectations in their home countries, they typically look for better career opportunities in other countries. Thus, this study proposes that:

H2: There is a relationship between career prospect and factors influencing brain drain in Malaysia: students' perception.

Family and Friend

According to Maimunah et al (2024), stated that family and friends have big influence on the individuals to work in overseas. This can be supported by Mazzarol and Soutar (2002), where these individuals tend to believe family and friends above anything. Krasulja et al. (2016) found that having the backing of loved ones facilitated the finalization of an individual's decision to relocate abroad. Thus, this study proposes that:

H3: There is a relationship between family and friend influence and factors influencing brain drain in Malaysia: students' perception.

Quality of Life

According to Jauhar and Yusoff (2011), young people nowadays value their rights, safety, peace, education, and living standards within a country. This is because these people deserve the best for themselves and their families and tend to relocate overseas in search of the highest quality of life. Ishak and Abdul Aziz (2014) and Krasulja et al. (2016) agreed that quality of life is important as it influence the brain drain in Malaysia. Thus, this study proposes that:

H4: There is a relationship between quality of life and factors influencing brain drain in Malaysia: students' perception.

Working Environment

According to Noah and Steve (2012), poor working environment may influence an individual to move abroad. This is because these highly-skilled worker may experience dissatisfaction about their working environment for not reaching their expectations, thus lead to brain drain. Hussin and Peredaryenko (2022) and Jauhar and Yusoff (2011), also agreed that lack of important opportunities in working environment, such as implemented technological advancement, may also lead to these expatriates relocating overseas.

H5: There is a relationship between working environment and factors influencing brain drain in Malaysia: students' perception.

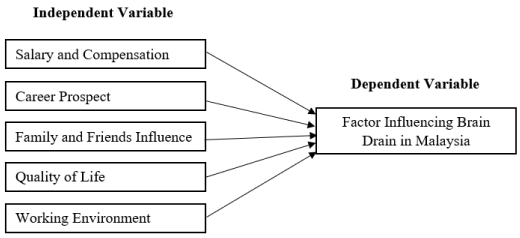

Figure 3: Conceptual Framework
Source: Develop for this study

METHODOLOGY

Conceptual model of the study

This study was conducted using a survey as the data collection method. The researcher used a Google Forms-based online survey as the primary data through various ways, including social media and email. The target population of this study are college or university students in Malaysia. The data will be analyzed using SPSS and PLS-SEM accordingly. The SPSS will be used for the initial analysis, and further analysis continue with PLS-SEM. The secondary data for this study is based on academic journals, newspapers, books, and conference papers. Using previously collected data guarantees that the information used in this study is accurate and reliable

Instrumentation

The review of literature supports a researcher to describe and analyse the theories and concepts of the theoretical framework of the research, as well as determine proper methods and instruments to be adapted in order to define the research objectives (Hair et al. 2016). This study adapted and constructed survey instruments from existing related studies; Salary and compensation (Ab. Wahab, 2014), Career Prospect ((Bushiri, 2014; Tansel & Gungor, 2005; Berzegar et al., 2012), Family and Friends Influence(Liew,2013; (Weerasinghe & Kumar, 2014; (Ab. Wahab, 2014), Quality of life (Muaremi, 2019; (Berzegar et al., 2012; Leong & Soon, 2011), working environment ((Weerasinghe & Kumar, 2014; Work Environment Survey Report of Results, 2011) and Factors Influencing Brain Drain in Malaysia (Sing et al., 2014; Weerasinghe & Kumar, 2014; Ab. Wahab, 2014).

As a result, 25 items were generated for the data collection. The instrument consists of three sections which are Section A, Section B and Section C. Section A comprises of question demographic profile on the respondents such as gender, age, races, current occupation and other information. Meanwhiles, Section B, the questionnaire comprises about independent variables which salary and compensation, career prospects, family and friends influence, quality of life and lastly, working environment. Next, Section C will be question regarding dependent variables which is factors influencing brain drain in Malaysia: students' perception. Further, Section B and Section C will be using five-points Likert Scales. The instrument's measurement items for both the independent variables and the dependent variable were adapted from earlier studies to ensure reliability and validity.

Data Collection

The researcher uses an online survey to collect information for this study. Google Form used for this purpose. Indeed, the researcher used both primary and secondary sources to compile the data for the study.

The population of this study are the college or university student in entire peninsular Malaysia. Since there are many universities including private and public sector available here. The reason of distributing questionnaire to students as they are the next 'brain drain' candidates. The preparation or readiness of them is essential to determine the factors of affecting brain drain. This study's respondents will be taken to be representative of the student and working population in Malaysia using the convenience sampling method. Since the researcher uses Google survey form, then convenience sampling is the most suitable way. The researcher sent the google form through students' email and universities' social media account.

Sample Size

It is important to collect a sufficient sample size to avoid any errors in the ratio result. Based on to G*Power's calculation, the study needs minimum of 138 sample. This questionnaire based on having 5 independent variables in linear multiple regression, fixed model with R^2 from zero under F-test**.** However, the researcher decided to select 220 respondents in order to prevent any inaccurate data.

Data Preparation

The process of data conversion where they can be processed by the computer was known as data preparation. The data preparation in this study was completed to ensure the completeness and accuracy of the data (Hair et al. 2010). The assessment of skewness and kurtosis as well as Q-Q plot and histogram was completed to ensure the normality of the data collected is appropriate for use.

RESULTS

Measurement models in the study

Measurement model evaluate the process of reliability and validity of the construct measures. Four measurements namely, reflective indicator loadings, internal consistency reliability, convergent validity, and discriminant validity were evaluated for this process.

Reflective Indicator Loadings

The PLS-SEM output format has been used in reporting the reflective indicator. Table 1 shows the detailed final results of all construct's reflective model assessments. The details and output of reflective indicator reveals that few loading were lower than the threshold or recommended values. Based on the output of PLS-SEM process, many indicators achieved the recommended value of > 0.700 (Hair et al. 2019). However, some indicators show values less than the threshold. Namely, SC5 (-0.088), cp 1 (0.560), FF1 5 (0.677), QL3 (0.548), WE 1 (0.502), WE 4 (0.505). The lower indicators were removed from the further process (Hair et al. 2016).

Internal consistency reliability

Internal consistency reliability was applied for the evaluation of consistency of outputs across items. In PLS-SEM process for this study shows both Cronbach's alpha and composite reliability were tested (Hair et al. 2019). The required values for internal consistency reliability measured between 0 and 1, while the higher value reveals the higher level of validity. According to the Hair et al. (2019), the values of Cronbach's alpha and composite reliability need to be higher than 0.700.

Table 1 presents the detail of Cronbach's alpha and composite reliability values. From the table, it can be seen that the Cronbach's alpha and the composite reliability values for most construct were stable, equivalent, and the internal consistency reliability which more than the recommended value of 0.708, and were lower than the maximum value of 0.950, except for the salary & compensation which is 0.688.

Convergent Validity

For the convergent validity, AVE values need to be reported as recommended metric (Hair et al. 2019).PLS-SEM algorithm has been used to calculate the AVE, the minimum required value of AVE IS 0.50 or higher, that explaining 50% or more of the variance of the items for the construct. In the present study, all constructs are greater than 0.50 or explaining 50 % or more about the variance of the items for the construct.

Table 1: Outer loading, Cronbach's alpha, composite reliability, and AVE

Constructs	Items	Outer loading	Cronbach's Alpha	Composite reliability	Ave
Salary and Compensation	SC 1	0.864			
	SC 2	0.727			
	SC 3	0.791			
	SC 4	0.850	0.825	0.884	0.656
Career Prospect	CP 2	0.819	0.827	0.885	0.657
	CP 3	0.803			
	CP 4	0.815			
	CP 5	0.806			
Family and Friends Influence	FF1 1	0.876	0.836	0.889	0.668
	FF1 2	0.787			
	FF1 3	0.810			
	FF1 4	0.794			
Quality of Life	QL 1	0.890	0.906	0.934	0.781
	QL 2	0.836			
	QL 4	0.898			
	QL 5	0.908			
Working Environment	WE 2	0.886	0.815	0.890	0.731
	WE 3	0.885			
	WE 5	0.789			
Factor Influencing Brain Drain in Malaysia	BD 1	0.872	0.856	0.898	0.639
	BD 2	0.881			
	BD 3	0.755			
	BD 4	0.721			
	BD 5	0.753			

Discriminant validity

Discriminant validity defined as "the extent to which a construct is empirically different from other construct in the structural model ((Hair et al. 2019, p.13). For using the Fornell- Larcker criterion (traditional metric method), "the shared variance for all model constructs should not be larger than their AVEs" (in Hair et al.2019, p. 14). In this study, it can be noted that the AVE of each construct is higher than the its shared variable in Table 2. Based on the criteria of Fornell-Larcker. Hence, it can be concluded that discriminant validity for this study was established.

According to Hair et al. (2016), discriminant validity can be established when an indicator loading on a construct is higher than that of all of its cross-loadings on the other constructs. Table 2 Shows all indicators' outer loadings and their cross-loadings for other indicators. It is noted that the outer loadings (in bold) for each construct was higher than the all cross-loadings on other constructs,.

FINDINGS

The assessment of the structural model involves the evaluation of the predictive ability of the model. There are six stages in this process (Hair et al. 2016). Namely, 1: Evaluation of collinearity, 2:The path coefficients (β), 3: the coefficient of determination (R2), 4: , the effect size of f2, 5, 6: Q2 and its effect size (Hair et al. 2019).

Table 2 : Fornell-Larcker criterion

	BD	**CP**	**FFI**	**QL**	**SC**	**WE**
CP	0.799					
BD	0.795	0**.811**				
FF1	0.678	0.555	**0.817**			
QL	0.787	0.758	0.606	**0.884**		
SC	0.723	0.754	0.491	0.741	**0.810**	
WE	0.682	0.711	0.649	0.745	0.603	**0.855**

Collinearity issue

Variance Inflation Tolerance (VIF) can be employed for detecting multicollinearity problem instead of using correlation coefficient in the case of Smart- PLS. If the inner VIF values are less than five assume that the variables are free from multicollinearity. However, if the inner VIF values are higher than five then the corresponding items must be deleted to make the data set free from collinearity (Habibi et al. 2020). In the present research, the inner VIF values found from measurement model results where the inner VIF values of all the constructs were less than five. However, according to Pallant (2007), suggested that if the inner VIF values are bigger than 10 and less than 0.1, it considers the multicollinearity exists.

Table 3: Result of multicollinearity – Inner VIF values

Exogenous Variables	**BD**
SC	2.754
CP	3.261
FFI	1.842
QL	3.515
WE	2.857

Structural Model Relationship

This study completed bootstrapping procedure to assess the relationship between independent variables and dependent variable of this study with n of 5000, assuming 5% significant level, all

relationships in the structural model are significant, except the relationship between WE and BD, the PLS-SEM output were significant on proposed relationships that support H1, H2, H3 and H4.In detail, SC shows significant effects on BD ((β = 0.136; p< 0.01) and CP (β = 0.357; p< 0.01). In addition, FFI significantly predicts BD (β= 0.266; p < 0.01) and finally, QL showed significant in determining BD (β = 0.282; p < 0.01).

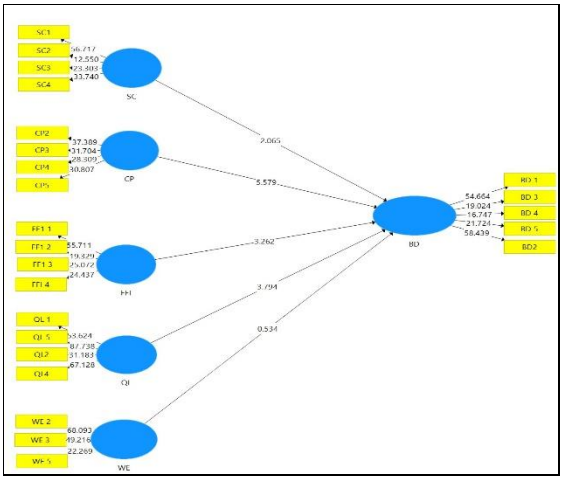

Figure 2: Bootstrapping results

Table 4 : Path coefficient result

Hypothesis	Beta	T	P	Decision
CP- > BD	0.357	5.546	0.000	Supported
FFI- > BD	0.266	3.314	0.001	Supported
SC- > BD	0.136	2.065	0.039	Supported
QL - >BD	0.282	3.859	0.000	supported
WE- > BD	-0.036	0.534	**0.593**	**Not supported**

Table 5: R2 value

Endogenous Variable	R Square	R Square Adjusted
BD	0.760	0.754

R2 is the value that measures the model's predictive accuracy and is calculated as the squares correlation between a particular endogenous construct's, or dependent variable's real and predicted values (Hair et al. 2016).R2 square determines the variance described by the endogenous construct. The R2 value ranges between 0 and 1, the higher value of R2 defines a higher level of predictive accuracy. R2 value of 0.75 is considered as as large, while 0.50 is moderate and 0.25 defied as weak (Hair et al. 2016). The R2 results of this research is presented in Table 5, where R2 value of dependent variable BD is above 25% demonstrates a substantial prediction level in empirical research (Cohen,1989).

F2 represents the effect size. The F2 value from 0.02 to 0.15 considered a small effect while the value from 0.15 to 0.35 represents medium effect, and the F2 values above 0.35 considered as large effect (Sarstedt et a. 2017). Based on table 6 **,** SC, QL has small effect as the f2 values are between 0.02 and 0.15. Similarly, CP, FFI have medium effect on BD.

Table 6: f2 effect size

Exogenous Variables	R2	Consideration
SC	0.028	Small
CP	0.162	Medium

FFI	0.160	Medium
QL	0.094	Small
WE	0.002	No effect

The final stage of this study involving the predictive relevance of the model through the Stone-Geisser's Q2 value. According to Hair et al. (2016), when the model presents predictive relevance, it is correct to predict the data points of indicators in the model. For the structural model assessment, Q2 value is larger than 0 for the reflective construct shows that the model's predictive relevance for the construct is achieved (0.02 as small; 0.15 as medium 0.35 as large). The blindfolding procedure was completed using SmartPLS 3.0 to assess the Q2 predictive relevance (Hair et al. 2019). In is study, all Q2 predictive values are bigger than zero. Hence, the entire model demonstrates an adequate fit and high predictive relevance.

DISCUSSION AND CONCLUSION

The main aim of this study identifies the factors that influence Brain Drain in Malaysia. First the researcher developed an instrument based on existing studies and distributed the instrument via google form using the convenience sampling**.** This sampling involves selecting a sample of the population that is convenient for the researcher to contact. Since the researcher uses Google survey form, then convenience sampling is the most suitable way.

Once the data collected from the target respondents, data went through screening process namely, normalization test like Skewness and Kurtosis & export into SMART PLS for further analysis**.**

After the data preparation process, the researcher measured the model by examining the model reflective indicator loadings, internal consistency reliability, convergent validity and discriminant validity (Hair el al. 2019). Based on this process, 6 indicators were dropped as they did not meet the target threshold values. Hence, 24 indicators were continued with the assessment of structural model. Further, from the proposed five hypotheses, four hypotheses were supported. In detail, salary and compensation (SC), career prospect (CP), family and friends influence (FFI), quality of life (QL) were influential factors for the brain drain in Malaysia from the students' perspective. The findings of this study is similar to Shariff et al. (2018).

In addition, Hendel and Kagan (2011) found quality of life is important factor for the brain drain among Isreli nurses and nursing students. Moreover, previous like Kangasniemi et al. (2007) found career advancement is main contributing factor for the brain drain in the context of United Kingdom among the doctors. Furthermore, Tahir et al. (2011) found that high income/financial advantage is the cause for the brain drain of doctors in Pakistan. The present research rejects the working environment as one of the contributing factors for the brain drain in Malaysia. In contrast, past studies like Connell et al. (2007) claimed that working environment is one of the predicting factor for the health workers migration in Africa. This may be the possible cause in the African context. However, in Malaysian's perception it is not an essential factor for the brain drain. As they might consider other factors are important.

A few studies are focused on factors influence brain drain in Malaysia from the students' perception. Hence, we filled the gap by identifying the significant factors for the brain drain in Malaysia from the students' perspective. The aim of this study was to identify the factors that influence brain drain in Malaysia. Based on the quantitative data output, Salary and Compensation (SC), Career Prospect (CP), Family and Friends Influence (FFI) and Quality of Life (QL) are most predicting factors for the brain drain in Malaysia from the perception of students.

This research will be helpful to the government of Malaysia, as it can determine what it needs to do in order to attract and keep Malaysia's educated and highly skilled population to continue serving the country. The findings of this study may help the government of Malaysia realize and understand the significance of salary and compensation, career prospects, family and friends influence, quality of life, and the working environment in developing and implementing a new policy maker that exceeds the expectations of tertiary students' graduates and also to reattract the highly talented workers in overseas to work back in Malaysia. For instance, the Malaysian government may adjust a new policy maker through scholarship education towards talented students. This is because many talented

students who are capable of getting overseas scholarships from the government work abroad after they finish their studies. Therefore, the government may solve this problem by adjusting a new policy maker to prevent the loss of highly skilled workers in the future.

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